DEPARTMENT OF COMMUNITY HEALTH

OFFICE OF THE DIRECTOR

DELAYED REGISTRATION OF BIRTHS

R 326.1
Source: 1997 AACS.

R 326.2
Source: 1997 AACS.

R 326.3
Source: 1997 AACS.

R 326.4
Source: 1997 AACS.

R 326.5
Source: 1997 AACS.

DISTRICT AND COUNTY HEALTH DEPARTMENTS

PART 1. SERVICES

R 327.1
Source: 1997 AACS.

R 327.2
Source: 1997 AACS.

R 327.3
Source: 1997 AACS.

R 327.4
Source: 1997 AACS.

R 327.5
Source: 1997 AACS.

R 327.6
Source: 1997 AACS.

R 327.7
Source: 1997 AACS.

R 327.8
Source: 1997 AACS.

R 327.9
Source: 1997 AACS.

R 327.10
Source: 1997 AACS.

PART 2. PERSONNEL CLASSIFICATION AND QUALIFICATIONS

R 327.47
Source: 1997 AACS.

DIRECTOR OF COMMUNITY HEALTH

GENERAL RULES

R 330.20
Source: 1997 AACS.

R 330.21
Source: 1997 AACS.

R 330.30
Source: 1997 AACS.

R 330.31
Source: 1997 AACS.

R 330.32
Source: 1997 AACS.

R 330.33
Source: 1997 AACS.

R 330.34
Source: 1997 AACS.

R 330.35
Source: 1997 AACS.

R 330.36
Source: 1997 AACS.

R 330.37
Source: 1997 AACS.

R 330.40
Source: 1997 AACS.

R 330.41
Source: 1997 AACS.

R 330.42
Source: 1997 AACS.

R 330.43
Source: 1997 AACS.

R 330.44
Source: 1997 AACS.

R 330.45
Source: 1997 AACS.

R 330.46
Source: 1997 AACS.

R 330.47
Source: 1997 AACS.

R 330.48
Source: 1997 AACS.

R 330.50
Source: 1997 AACS.

R 330.51
Source: 1997 AACS.

R 330.52
Source: 1997 AACS.

R 330.53
Source: 1997 AACS.

R 330.54
Source: 1997 AACS.

R 330.55
Source: 1997 AACS.

R 330.56
Source: 1997 AACS.

R 330.60
Source: 1997 AACS.

R 330.61
Source: 1997 AACS.

R 330.62
Source: 1997 AACS.

R 330.63
Source: 1997 AACS.

R 330.64
Source: 1997 AACS.

R 330.70
Source: 1997 AACS.

R 330.80
Source: 1997 AACS.

R 330.81
Source: 1997 AACS.

R 330.82
Source: 1997 AACS.

R 330.83
Source: 1997 AACS.

R 330.84
Source: 1997 AACS.

R 330.90
Source: 1997 AACS.

R 330.91
Source: 1997 AACS.

R 330.92
Source: 1997 AACS.

R 330.93
Source: 1997 AACS.

R 330.94
Source: 1997 AACS.

R 330.95
Source: 1997 AACS.

R 330.96
Source: 1997 AACS.

R 330.97
Source: 1997 AACS.

R 330.98
Source: 1997 AACS.

R 330.99
Source: 1997 AACS.

R 330.100
Source: 1997 AACS.

R 330.101
Source: 1997 AACS.

R 330.102
Source: 1997 AACS.

R 330.103
Source: 1997 AACS.

R 330.104
Source: 1997 AACS.

R 330.105
Source: 1997 AACS.

R 330.106
Source: 1997 AACS.

R 330.107
Source: 1997 AACS.

R 330.108
Source: 1997 AACS.

R 330.109
Source: 1997 AACS.

R 330.111
Source: 1997 AACS.

R 330.112
Source: 1997 AACS.

R 330.113
Source: 1997 AACS.

R 330.114
Source: 1997 AACS.

R 330.115
Source: 1997 AACS.

R 330.116
Source: 1997 AACS.

R 330.117
Source: 1997 AACS.

HEALTH LEGISLATION AND POLICY DEVELOPMENT

GENERAL RULES

PART 1. DEPARTMENT OF MENTAL HEALTH

SUBPART 1. GENERAL PROVISIONS

R 330.1001
Source: 1998-2000 AACS.

R 330.1005
Source: 1983 AACS.

R 330.1010
Source: 1997 AACS.

R 330.1017
Source: 1981 AACS.

R 330.1019
Source: 1983 AACS.

SUBPART 2. COMMUNITY MENTAL HEALTH CENTERS

R 330.1025
Source: 1981 AACS.

SUBPART 3. MENTAL RETARDATION FACILITIES

R 330.1075
Source: 1997 AACS.

SUBPART 4. LICENSING AND REGULATION OF MENTAL HEALTH HOSPITALS, PSYCHIATRIC FACILITIES, AND PSYCHIATRIC UNITS

R 330.1201
Source: 1988 AACS.

R 330.1210
Source: 1984 AACS.

R 330.1214
Source: 1990 AACS.

R 330.1239
Source: 1990 AACS.

R 330.1243
Source: 1990 AACS.

R 330.1255
Source: 1986 AACS.

R 330.1265
Source: 1981 AACS.

R 330.1269
Source: 1983 AACS.

R 330.1275
Source: 1990 AACS.

R 330.1276
Source: 1988 AACS.

R 330.1281
Source: 1986 AACS.

R 330.1285
Source: 1986 AACS.

R 330.1287
Source: 1986 AACS.

R 330.1289
Source: 1986 AACS.

R 330.1291
Source: 1986 AACS.

SUBPART 5. FOSTER CARE CONTRACT REVOCATION

R 330.1401
Source: 1997 AACS.

SUBPART 6. FAMILY SUPPORT SUBSIDY PROGRAM

R 330.1601
Source: 2004 AACS.

R 330.1606
Source: 2004 AACS.

R 330.1607
Source: 1990 AACS.

R 330.1611
Source: 1984 AACS.

R 330.1613
Source: 1984 AACS.

R 330.1616
Source: 1984 AACS.

R 330.1621
Source: 1990 AACS.

R 330.1626
Source: 1990 AACS.

R 330.1631
Source: 1984 AACS.

R 330.1636
Source: 1984 AACS.

R 330.1641
Source: 1984 AACS.

R 330.1643
Source: 1984 AACS.

R 330.1646
Source: 1984 AACS.

R 330.1651
Source: 1984 AACS.

R 330.1656
Source: 2003 AACS.

SUBPART 7. PLACEMENT OF ADULTS WHO HAVE A MENTAL ILLNESS OR A DEVELOPMENTAL DISABILITY INTO COMMUNITY-BASED DEPENDENT LIVING SETTINGS

R 330.1701
Source: 1996 AACS.

R 330.1702
Source: 1996 AACS.

R 330.1703
Source: 1996 AACS.

R 330.1704
Source: 1996 AACS.

SUBPART 8. CERTIFICATION OF SPECIALIZED PROGRAMS OFFERED IN ADULT FOSTER CARE HOME TO CLIENTS WITH MENTAL ILLNESS OR DEVELOPMENTAL DISABILITY

R 330.1801

Source: 1996 AACS.

R 330.1802
Source: 1996 AACS.

R 330.1803
Source: 1996 AACS.

R 330.1804
Source: 1996 AACS.

R 330.1805
Source: 1996 AACS.

R 330.1806
Source: 1996 AACS.

R 330.1807
Source: 1996 AACS.

R 330.1808
Source: 1996 AACS.

R 330.1809
Source: 1996 AACS.

PART 2. COUNTY COMMUNITY MENTAL HEALTH SERVICES PROGRAMS

SUBPART 1. COMMUNITY MENTAL HEALTH SERVICES

R 330.2005
Source: 1986 AACS.

R 330.2006
Source: 1983 AACS.

R 330.2007
Source: 1986 AACS.

R 330.2012
Source: 1981 AACS.

R 330.2013
Source: 1984 AACS.

R 330.2014
Source: 1986 AACS.

R 330.2022
Source: 1986 AACS.

SUBPART 2. COMMUNITY MENTAL HEALTH BOARD REPORTS

R 330.2038
Source: 1986 AACS.

R 330.2039
Source: 1986 AACS.

SUBPART 4. COMMUNITY MENTAL HEALTH BOARD

R 330.2067
Source: 1986 AACS.

R 330.2071
Source: 1986 AACS.

SUBPART 5. COMMUNITY MENTAL HEALTH DIRECTOR

R 330.2081
Source: 1990 AACS.

SUBPART 6. CHILDREN'S DIAGNOSTIC AND TREATMENT SERVICE

R 330.2105
Source: 1990 AACS.

R 330.2110
Source: 1990 AACS.

R 330.2115
Source: 1990 AACS.

R 330.2120
Source: 1990 AACS.

R 330.2125
Source: 1990 AACS.

R 330.2130
Source: 1990 AACS.

R 330.2135
Source: 1997 AACS.

SUBPART 7. CERTIFICATION PROCESS

R 330.2701
Source: 1997 AACS.

R 330.2702
Source: 1997 AACS.

R 330.2703
Source: 1997 AACS.

SUBPART 8. CERTIFICATION STANDARDS

R 330.2801
Source: 1997 AACS.

R 330.2802
Source: 1997 AACS.

R 330.2803
Source: 1997 AACS.

R 330.2804
Source: 1997 AACS.

R 330.2805
Source: 1997 AACS.

R 330.2806
Source: 1997 AACS.

R 330.2807
Source: 1997 AACS.

R 330.2808
Source: 1997 AACS.

R 330.2809
Source: 1997 AACS.

R 330.2810
Source: 1997 AACS.

R 330.2811
Source: 1997 AACS.

R 330.2812
Source: 1997 AACS.

R 330.2813
Source: 1997 AACS.

R 330.2814
Source: 1997 AACS.

PART 3. STATE AND COUNTY FINANCIAL RESPONSIBILITY

R 330.3010
Source: 1997 AACS.

R 330.3017
Source: 1986 AACS.

PART 4. ADMINISTRATIVE ACTION FOR MENTALLY ILL PERSONS REQUIRING TREATMENT AND THOSE DEEMED CLINICALLY SUITABLE FOR HOSPITALIZATION

SUBPART 1. DESIGNATED HOSPITALS

R 330.4005
Source: 1997 AACS.

R 330.4008
Source: 1997 AACS.

SUBPART 2. TRANSFER REQUIREMENTS

R 330.4011
Source: 1986 AACS.

R 330.4013
Source: 1986 AACS.

R 330.4015
Source: 1997 AACS.

SUBPART 3. ADMISSION CONDITIONS

R 330.4025
Source: 1997 AACS.

R 330.4028
Source: 1997 AACS.

R 330.4033
Source: 1997 AACS.

R 330.4035
Source: 1997 AACS.

R 330.4039
Source: 1981 AACS.

R 330.4043
Source: 1997 AACS.

R 330.4045
Source: 1986 AACS.

R 330.4047
Source: 1986 AACS.

R 330.4049
Source: 1986 AACS.

R 330.4059
Source: 1997 AACS.

SUBPART 4. PERIODIC REVIEW

R 330.4065
Source: 1997 AACS.

R 330.4067
Source: 1997 AACS.

SUBPART 5. RELEASE AND DISCHARGE

R 330.4075
Source: 1997 AACS.

R 330.4077
Source: 1990 AACS.

R 330.4081
Source: 1997 AACS.

R 330.4083

Source: 1990 AACS.

R 330.4086
Source: 1997 AACS.

R 330.4091
Source: 1997 AACS.

R 330.4093
Source: 1997 AACS.

R 330.4095
Source: 1997 AACS.

PART 4A. CIVIL ADMISSION AND DISCHARGE PROCEDURES FOR EMOTIONALLY DISTURBED MINORS

SUBPART 1. GENERAL PROVISIONS

R 330.4501
Source: 1990 AACS.

R 330.4510
Source: 1997 AACS.

R 330.4512
Source: 1997 AACS.

R 330.4515
Source: 1997 AACS.

SUBPART 2. ADMISSIONS

R 330.4601
Source: 1997 AACS.

R 330.4603
Source: 1990 AACS.

R 330.4606
Source: 1997 AACS.

R 330.4611
Source: 1990 AACS.

SUBPART 3. PERIODIC REVIEW

R 330.4616
Source: 1997 AACS.

SUBPART 4. CHANGE IN STATUS OF HOSPITALIZATION

R 330.4620
Source: 1990 AACS.

R 330.4621
Source: 1997 AACS.

R 330.4626

Source: 1990 AACS.

R 330.4631
Source: 1990 AACS.

R 330.4636
Source: 1990 AACS.

R 330.4641
Source: 1990 AACS.

R 330.4646
Source: 1990 AACS.

SUBPART 5. OBJECTION TO HOSPITALIZATION PROCESS

R 330.4651
Source: 1990 AACS.

R 330.4656
Source: 1990 AACS.

R 330.4661
Source: 1990 AACS.

PART 5. ADMINISTRATIVE ACTION FOR DEVELOPMENTALLY DISABLED PERSONS REQUIRING CARE AND TREATMENT

SUBPART 1. DESIGNATED RESIDENTIAL FACILITIES

R 330.5005
Source: 1986 AACS.

R 330.5008
Source: 1997 AACS.

SUBPART 2. TRANSFER REQUIREMENTS

R 330.5011
Source: 1997 AACS.

R 330.5013
Source: 1997 AACS.

SUBPART 3. ADMISSION CONDITIONS

R 330.5025
Source: 1997 AACS.

R 330.5028
Source: 1997 AACS.

R 330.5031
Source: 1981 AACS.

R 330.5033
Source: 1983 AACS.

R 330.5045
Source: 1997 AACS.

SUBPART 4. PERIODIC REVIEW

R 330.5065
Source: 1997 AACS.

SUBPART 5. RELEASE AND DISCHARGE

R 330.5075
Source: 1997 AACS.

R 330.5081
Source: 1997 AACS.

R 330.5083
Source: 1997 AACS.

R 330.5086
Source: 1981 AACS.

R 330.5093
Source: 1997 AACS.

R 330.5095
Source: 1997 AACS.

PART 6. GUARDIANSHIP FOR RECIPIENTS OF MENTAL HEALTH SERVICES

R 330.6013
Source: 1981 AACS.

R 330.6031
Source: 1986 AACS.

PART 7. RIGHTS OF RECIPIENTS OF MENTAL HEALTH SERVICES

SUBPART 1. GENERAL PROVISIONS

R 330.7001
Source: 1998-2000 AACS.

R 330.7002
Source: 1998-2000 AACS.

R 330.7003
Source: 1998-2000 AACS.

R 330.7005
Source: 1998-2000 AACS.

SUBPART 2. RIGHTS OF RECIPIENTS OF MENTAL HEALTH SERVICES

R 330.7009

Source: 1998-2000 AACS.

R 330.7011
Source: 1998-2000 AACS.

R 330.7012
Source: 1998-2000 AACS.

R 330.7014
Source: 1998-2000 AACS.

R 330.7017
Source: 1998-2000 AACS.

R 330.7029
Source: 1998-2000 AACS.

R 330.7032
Source: 1998-2000 AACS.

R 330.7035
Source: 1998-2000 AACS.

R 330.7037
Source: 1998-2000 AACS.

R 330.7045
Source: 1998-2000 AACS.

R 330.7046
Source: 1998-2000 AACS.

R 330.7051
Source: 1998-2000 AACS.

SUBPART 3. ADDITIONAL RIGHTS OF RESIDENTS OF FACILITIES

R 330.7125
Source: 1998-2000 AACS.

R 330.7131
Source: 1997 AACS.

R 330.7135
Source: 1998-2000 AACS.

R 330.7139
Source: 1998-2000 AACS.

R 330.7142
Source: 1998-2000 AACS.

R 330.7145
Source: 1998-2000 AACS.

R 330.7151
Source: 1998-2000 AACS.

R 330.7158

Source: 1998-2000 AACS.

R 330.7161
Source: 1998-2000 AACS.

R 330.7165
Source: 1998-2000 AACS.

R 330.7171
Source: 1981 AACS.

R 330.7175
Source: 1998-2000 AACS.

R 330.7181
Source: 1998-2000 AACS.

R 330.7185
Source: 1998-2000 AACS.

R 330.7188
Source: 1998-2000 AACS.

R 330.7189
Source: 1998-2000 AACS.

R 330.7191
Source: 1998-2000 AACS.

R 330.7195
Source: 1998-2000 AACS.

R 330.7199
Source: 1998-2000 AACS.

R 330.7205
Source: 1998-2000 AACS.

R 330.7221
Source: 1997 AACS.

R 330.7227
Source: 1998-2000 AACS.

R 330.7229
Source: 1998-2000 AACS.

R 330.7231
Source: 1998-2000 AACS.

R 330.7235
Source: 1998-2000 AACS.

R 330.7239
Source: 1998-2000 AACS.

R 330.7243
Source: 1998-2000 AACS.

R 330.7251
Source: 1998-2000 AACS.

R 330.7253
Source: 1998-2000 AACS.

R 330.7254
Source: 1998-2000 AACS.

R 330.7260
Source: 1981 AACS.

PART 8. FINANCIAL LIABILITY FOR MENTAL HEALTH SERVICES

R 330.8005
Source: 1997 AACS.

R 330.8008
Source: 1997 AACS.

R 330.8012
Source: 1997 AACS.

R 330.8024
Source: 1981 AACS.

SUBPART 2. COMMUNITY MENTAL HEALTH

R 330.8201
Source: 1997 AACS.

R 330.8204
Source: 1997 AACS.

R 330.8205
Source: 1997 AACS.

R 330.8206
Source: 1997 AACS.

R 330.8207
Source: 1997 AACS.

R 330.8208
Source: 1997 AACS.

R 330.8209
Source: 1997 AACS.

R 330.8210
Source: 1997 AACS.

R 330.8214
Source: 1997 AACS.

R 330.8215
Source: 1997 AACS.

R 330.8217
Source: 1997 AACS.

R 330.8220
Source: 1997 AACS.

R 330.8224
Source: 1997 AACS.

R 330.8227
Source: 1997 AACS.

R 330.8229
Source: 1997 AACS.

R 330.8230
Source: 1997 AACS.

R 330.8234
Source: 1997 AACS.

R 330.8237
Source: 1997 AACS.

R 330.8238
Source: 1997 AACS.

R 330.8239
Source: 1997 AACS.

R 330.8240
Source: 1997 AACS.

R 330.8241
Source: 1997 AACS.

R 330.8242
Source: 1997 AACS.

R 330.8244
Source: 1997 AACS.

R 330.8250
Source: 1997 AACS.

R 330.8251
Source: 1997 AACS.

R 330.8254
Source: 1997 AACS.

R 330.8256
Source: 1997 AACS.

R 330.8257
Source: 1997 AACS.

R 330.8264
Source: 1997 AACS.

R 330.8267
Source: 1997 AACS.

R 330.8270
Source: 1997 AACS.

R 330.8273
Source: 1997 AACS.

R 330.8275
Source: 1997 AACS.

R 330.8277
Source: 1997 AACS.

R 330.8279
Source: 1997 AACS.

R 330.8280
Source: 1997 AACS.

R 330.8284
Source: 1997 AACS.

PART 9. MISCELLANEOUS PROVISIONS

SUBPART 1. LAFAYETTE CLINIC

R 330.9001
Source: 1997 AACS.

R 330.9005
Source: 1997 AACS.

R 330.9007
Source: 1997 AACS.

R 330.9009
Source: 1997 AACS.

R 330.9011
Source: 1997 AACS.

SUBPART 2. NEURO-PSYCHIATRIC INSTITUTE

R 330.9121
Source: 1997 AACS.

R 330.9123
Source: 1997 AACS.

R 330.9125
Source: 1997 AACS.

SUBPART 3. ADMINISTRATIVE PROCEDURE

R 330.9201
Source: 1997 AACS.

R 330.9205
Source: 1997 AACS.

R 330.9208
Source: 1997 AACS.

R 330.9210
Source: 1997 AACS.

R 330.9215
Source: 1997 AACS.

R 330.9220
Source: 1997 AACS.

R 330.9222
Source: 1997 AACS.

R 330.9225
Source: 1997 AACS.

SUBPART 4. IMPACT STATEMENTS

R 330.9301
Source: 1986 AACS.

R 330.9306
Source: 1986 AACS.

SUBPART 5. CONDUCT ON DEPARTMENT PROPERTY

R 330.9401
Source: 1988 AACS.

R 330.9406
Source: 1988 AACS.

R 330.9411
Source: 1988 AACS.

R 330.9416
Source: 1988 AACS.

R 330.9421
Source: 1988 AACS.

R 330.9426
Source: 1988 AACS.

R 330.9431
Source: 1988 AACS.

PART 10. CRIMINAL PROVISIONS

SUBPART 1. TRANSFER OF PRISONERS

R 330.10001
Source: 1997 AACS.

R 330.10002
Source: 1997 AACS.

R 330.10003
Source: 1997 AACS.

R 330.10004
Source: 1997 AACS.

R 330.10005
Source: 1997 AACS.

R 330.10006
Source: 1997 AACS.

R 330.10006a
Source: 1997 AACS.

R 330.10007
Source: 1997 AACS.

R 330.10008
Source: 1981 AACS.

R 330.10009
Source: 1981 AACS.

R 330.10010
Source: 1997 AACS.

R 330.10011
Source: 1981 AACS.

R 330.10012
Source: 1997 AACS.

R 330.10013
Source: 1981 AACS.

R 330.10014
Source: 1981 AACS.

R 330.10015
Source: 1997 AACS.

R 330.10016
Source: 1997 AACS.

R 330.10017
Source: 1997 AACS.

R 330.10018
Source: 1997 AACS.

R 330.10019
Source: 1997 AACS.

R 330.10020
Source: 1997 AACS.

R 330.10021
Source: 1997 AACS.

R 330.10022
Source: 1997 AACS.

R 330.10023
Source: 1997 AACS.

R 330.10024
Source: 1997 AACS.

R 330.10025
Source: 1997 AACS.

R 330.10026
Source: 1997 AACS.

R 330.10027
Source: 1997 AACS.

R 330.10028
Source: 1997 AACS.

R 330.10029
Source: 1997 AACS.

SUBPART 2. FORENSIC EXAMINATIONS

R 330.10055
Source: 1988 AACS.

R 330.10056
Source: 1988 AACS.

R 330.10057
Source: 1988 AACS.

R 330.10058
Source: 1988 AACS.

R 330.10059
Source: 1988 AACS.

DEPARTMENT OF COMMUNITY HEALTH

HEALTH LEGISLATION AND POLICY DEVELOPMENT

GENERAL RULES

PART 11. ENFORCEMENT SYSTEM FOR LONG-TERM CARE FACILITIES

R 330.11001
Source: 1998-2000 AACS.

R 330.11002
Source: 1998-2000 AACS.

R 330.11003
Source: 1998-2000 AACS.

R 330.11004
Source: 1998-2000 AACS.

R 330.11005
Source: 1998-2000 AACS.

R 330.11006
Source: 1998-2000 AACS.

R 330.11007
Source: 1998-2000 AACS.

R 330.11008
Source: 1998-2000 AACS.

R 330.11009
Source: 1998-2000 AACS.

R 330.11010
Source: 1998-2000 AACS.

R 330.11011
Source: 1998-2000 AACS.

R 330.11012
Source: 1998-2000 AACS.

R 330.11013
Source: 1998-2000 AACS.

R 330.11014
Source: 1998-2000 AACS.

R 330.11015
Source: 1998-2000 AACS.

R 330.11016
Source: 1998-2000 AACS.

R 330.11017
Source: 1998-2000 AACS.

DEPARTMENT OF TREASURY

STATE HOSPITAL FINANCE AUTHORITY

GENERAL RULES

R 331.1
Source: 1997 AACS.

R 331.2
Source: 1997 AACS.

R 331.3
Source: 1997 AACS.

R 331.4
Source: 1997 AACS.

R 331.5
Source: 1997 AACS.

R 331.6
Source: 1997 AACS.

R 331.7
Source: 1997 AACS.

R 331.8
Source: 1997 AACS.

R 331.9
Source: 1997 AACS.

R 331.10
Source: 1997 AACS.

R 331.11
Source: 1997 AACS.

R 331.12
Source: 1997 AACS.

R 331.13
Source: 1997 AACS.

DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR QUALITY DIVISION

GENERAL RULES

PART 1. DEFINITIONS

R 336.11
Source: 1997 AACS.

R 336.12
Source: 1997 AACS.

R 336.13
Source: 1997 AACS.

R 336.14
Source: 1997 AACS.

PART 2. AIR USE APPROVAL

R 336.21
Source: 1997 AACS.

R 336.26
Source: 1997 AACS.

R 336.28
Source: 1997 AACS.

R 336.29
Source: 1997 AACS.

R 336.30
Source: 1997 AACS.

R 336.31
Source: 1997 AACS.

R 336.32
Source: 1997 AACS.

R 336.33
Source: 1997 AACS.

R 336.34
Source: 1997 AACS.

R 336.35
Source: 1997 AACS.

R 336.36
Source: 1997 AACS.

PART 3. EMISSION LIMITATIONS AND PROHIBITIONS

R 336.41—R 336.49
Source: 1997 AACS.

R 336.42
Source: 1997 AACS.

R 336.43
Source: 1997 AACS.

R 336.44
Source: 1997 AACS.

R 336.45
Source: 1997 AACS.

R 336.46
Source: 1997 AACS.

R 336.47
Source: 1997 AACS.

R 336.48
Source: 1997 AACS.

R 336.49
Source: 1997 AACS.

PART 4. TESTING AND SAMPLING

R 336.51
Source: 1997 AACS.

R 336.52
Source: 1997 AACS.

R 336.53
Source: 1997 AACS.

R 336.54
Source: 1997 AACS.

PART 5. AIR CLEANING DEVICES AND COLLECTED CONTAMINANTS

R 336.61
Source: 1997 AACS.

R 336.62
Source: 1997 AACS.

PART 6. AIR POLLUTION EPISODES

R 336.71
Source: 1997 AACS.

R 336.72
Source: 1997 AACS.

R 336.73
Source: 1997 AACS.

R 336.74
Source: 1997 AACS.

R 336.75
Source: 1997 AACS.

R 336.76
Source: 1997 AACS.

R 336.77
Source: 1997 AACS.

R 336.78
Source: 1997 AACS.

R 336.79
Source: 1997 AACS.

PART 7. ANNUAL REPORTING AND SURVEILLANCE FEES

R 336.81
Source: 1997 AACS.

R 336.82
Source: 1997 AACS.

R 336.83
Source: 1997 AACS.

PART 8. SUSPENSION OF ENFORCEMENT

R 336.91
Source: 1997 AACS.

R 336.92
Source: 1997 AACS.

R 336.93
Source: 1997 AACS.

R 336.94
Source: 1997 AACS.

R 336.95
Source: 1997 AACS.

R 336.96
Source: 1997 AACS.

R 336.97
Source: 1997 AACS.

PART 10. ORGANIZATION, OPERATIONS, AND PROCEDURES

R 336.101
Source: 1997 AACS.

R 336.102
Source: 1997 AACS.

R 336.103
Source: 1997 AACS.

R 336.104
Source: 1997 AACS.

R 336.105
Source: 1997 AACS.

R 336.106
Source: 1997 AACS.

R 336.107
Source: 1997 AACS.

R 336.108
Source: 1997 AACS.

PART 11. HEARINGS

R 336.111
Source: 1997 AACS.

R 336.112
Source: 1997 AACS.

R 336.113
Source: 1997 AACS.

R 336.114
Source: 1997 AACS.

R 336.115
Source: 1997 AACS.

R 336.116
Source: 1997 AACS.

PART 14. EXTENSION OF COMPLIANCE DATE PAST JANUARY 1, 1980

R 336.141
Source: 1997 AACS.

R 336.142
Source: 1997 AACS.

R 336.143
Source: 1997 AACS.

R 336.144
Source: 1997 AACS.

R 336.145
Source: 1997 AACS.

R 336.146
Source: 1997 AACS.

R 336.147
Source: 1997 AACS.

AIR QUALITY DIVISION

ANNUAL REPORTING

R 336.201
Source: 1980 AACS.

R 336.202
Source: 1986 AACS.

R 336.203
Source: 1997 AACS.

R 336.204
Source: 1987 AACS.

R 336.205
Source: 1980 AACS.

DEPARTMENT OF ENVIROMENTAL QUALITY

AIR QUALITY DIVISION

DISBURSEMENT OF AIR POLLUTION SURVEILLANCE FEES TO LOCAL UNITS

R 336.501
Source: 1998-2000 AACS.

R 336.502
Source: 1998-2000 AACS.

R 336.503
Source: 1998-2000 AACS.

R 336.504
Source: 1998-2000 AACS.

R 336.505
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R 336.506
Source: 1998-2000 AACS.

R 336.507
Source: 1998-2000 AACS.

R 336.508
Source: 1998-2000 AACS.

MOTOR VEHICLE EMISSIONS INSPECTION/MAINTENANCE PROGRAM

R 336.601
Source: 1997 AACS.

R 336.602
Source: 1997 AACS.

R 336.603
Source: 1997 AACS.

AIR POLLUTION CONTROL

PART 1. GENERAL PROVISIONS

R 336.1101
Source: 2003 AACS.

R 336.1102
Source: 2002 AACS.

R 336.1103
Source: 2003 AACS.

R 336.1104
Source: 2002 AACS.

R 336.1105
Source: 2002 AACS.

R 336.1106
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R 336.1107
Source: 2002 AACS.

R 336.1108
Source: 2002 AACS.

R 336.1109
Source: 1998-2000 AACS.

R 336.1112
Source: 1992 AACS.

R 336.1113
Source: 2002 AACS.

R 336.1114
Source: 2003 AACS.

R 336.1115
Source: 1992 AACS.

R 336.1116
Source: 2003 AACS.

R 336.1118
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R 336.1119
Source: 2003 AACS.

R 336.1120
Source: 2002 AACS.

R 336.1121
Source: 1989 AACS.

R 336.1122
Source: 2003 AACS.

R 336.1123
Source: 1995 AACS.

R 336.1127
Source: 1980 AACS.

R 336.1128
Source: 1980 AACS.

PART 2. AIR USE APPROVAL

R 336.1201
Source: 2003 AACS.

R 336.1201a
Source: 2003 AACS.

R 336.1202
Source: 2003 AACS.

R 336.1203
Source: 2003 AACS.

R 336.1204
Source: 2003 AACS.

R 336.1205
Source: 2003 AACS.

R 336.1206
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R 336.1207
Source: 2003 AACS.

R 336.1208
Source: 1997 AACS.

R 336.1208a
Source: 1996 AACS.

R 336.1209
Source: 1995 AACS.

R 336.1210
Source: 2001 AACS.

R 336.1211
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R 336.1212
Source: 2003 AACS.

R 336.1213
Source: 2001 AACS.

R 336.1214
Source: 2001 AACS.

R 336.1214a
Source: 2003 AACS.

R 336.1215
Source: 2001 AACS.

R 336.1216
Source: 2003 AACS.

R 336.1217
Source: 1995 AACS.

R 336.1218
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R 336.1219
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R 336.1220
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R 336.1221
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R 336.1224
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R 336.1225
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R 336.1226
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R 336.1227
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R 336.1228
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R 336.1229
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R 336.1230
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R 336.1231
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R 336.1232
Source: 1998-2000 AACS.

R 336.1240
Source: 2003 AACS.

R 336.1241
Source: 2003 AACS.

R 336.1278
Source: 2003 AACS.

R 336.1278a
Source: 2003 AACS.

R 336.1279
Source: 2003 AACS.

R 336.1280
Source: 1995 AACS.

R 336.1281
Source: 2003 AACS.

R 336.1282
Source: 2003 AACS.

R 336.1283
Source: 1997 AACS.

R 336.1284
Source: 2003 AACS.

R 336.1285
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R 336.1286
Source: 1997 AACS.

R 336.1287
Source: 2003 AACS.

R 336.1288
Source: 1995 AACS.

R 336.1289
Source: 2003 AACS.

R 336.1290
Source: 1997 AACS.

R 336.1299
Source: 2003 AACS.

PART 3. EMISSION LIMITATIONS AND PROHIBITIONS—PARTICULATE MATTER

R 336.1301
Source: 2002 AACS.

R 336.1302
Source: 1997 AACS.

R 336.1303
Source: 2002 AACS.

R 336.1310
Source: 1998-2000 AACS.

R 336.1320
Source: 1998-2000 AACS.

R 336.1330
Source: 2002 AACS.

R 336.1331
Source: 2002 AACS.

R 336.1349
Source: 1980 AACS.

R 336.1350
Source: 1985 AACS.

R 336.1351
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R 336.1354
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R 336.1356
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R 336.1357
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R 336.1358
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R 336.1359
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R 336.1360
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R 336.1361
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R 336.1362
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R 336.1363
Source: 1998-2000 AACS.

R 336.1364
Source: 1985 AACS.

R 336.1365
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R 336.1366
Source: 1985 AACS.

R 336.1367
Source: 1985 AACS.

R 336.1370
Source: 1981 AACS.

R 336.1371
Source: 2002 AACS.

R 336.1372
Source: 2002 AACS.

R 336.1374
Source: 2002 AACS.

PART 4. EMISSION LIMITATIONS AND PROHIBITIONS—SULFUR-BEARING COMPOUNDS

R 336.1401
Source: 2002 AACS.

R 336.1402
Source: 1980 AACS.

R 336.1403
Source: 2002 AACS.

R 336.1404
Source: 1980 AACS.

PART 5. EXTENSION OF SULFUR DIOXIDE COMPLIANCE

DATE FOR POWER PLANTS PAST JANUARY 1, 1980

R 336.1501
Source: 1997 AACS.

R 336.1502
Source: 1997 AACS.

R 336.1503
Source: 1997 AACS.

R 336.1504
Source: 1997 AACS.

R 336.1505
Source: 1997 AACS.

R 336.1506
Source: 1997 AACS.

R 336.1507
Source: 1997 AACS.

PART 6. EMISSION LIMITATIONS AND PROHIBITIONS—EXISTING SOURCES OF VOLATILE ORGANIC COMPOUND EMISSIONS

R 336.1601

Source: 2002 AACS.

R 336.160
Source: 2002 AACS.

R 336.1603
Source: 1997 AACS.

R 336.1604
Source: 2002 AACS.

R 336.1605
Source: 2002 AACS.

R 336.1606
Source: 2002 AACS.

R 336.1608
Source: 2002 AACS.

R 336.1609
Source: 1989 AACS.

R 336.1610
Source: 2002 AACS.

R 336.1615
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R 336.1611
Source: 1997 AACS.

R 336.1612
Source: 1997 AACS.

R 336.1613
Source: 1997 AACS.

R 336.1614
Source: 1997 AACS.

R 336.1615
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R 336.1616
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R 336.1617
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R 336.1619
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R 336.1626
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R 336.1627
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R 336.1628
Source: 2002 AACS.

R 336.1629
Source: 2002 AACS.

R 336.1630
Source: 2002 AACS.

R 336.1631
Source: 2002 AACS.

R 336.1632
Source: 1993 AACS.

R 336.1651
Source: 2002 AACS.

PART 7. EMISSION LIMITATIONS AND PROHIBITIONS—NEW SOURCES OF VOLATILE ORGANIC COMPOUND EMISSIONS

R 336.1701
Source: 2002 AACS.

R 336.1702
Source: 2002 AACS.

R 336.1703
Source: 2002 AACS.

R 336.1704
Source: 2002 AACS.

R 336.1705
Source: 2002 AACS.

R 336.1706
Source: 1997 AACS.

R 336.1707
Source: 1997 AACS.

R 336.1708
Source: 1997 AACS.

R 336.1709
Source: 1997 AACS.

R 336.1710
Source: 1997 AACS.

PART 8. EMISSION LIMITATIONS AND PROHIBITIONS--OXIDES OF NITROGEN

R 336.1801
Source: 2002 AACS.

R 336.1802
Source: 2004 AACS.

R 336.1803
Source: 2002 AACS.

R 336.1804
Source: 2004 AACS.

R 336.1805
Source: 2002 AACS.

R 336.1806
Source: 2002 AACS.

R 336.1807
Source: 2002 AACS.

R 336.1808
Source: 2002 AACS.

R 336.1809
Source: 2002 AACS.

R 336.1810
Source: 2002 AACS.

R 336.1811
Source: 2004 AACS.

R 336.1814
Source: 2002 AACS.
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R 336.1815
Source: 2002 AACS.

R 336.1816
Source: 2002 AACS.

R 336.1817
Source: 2002 AACS.

PART 9. EMISSION LIMITATIONS AND PROHIBITIONS—MISCELLANEOUS

R 336.1901
Source: 2002 AACS.

R 336.1906
Source: 2002 AACS.

R 336.1910
Source: 1980 AACS.

R 336.1911
Source: 2002 AACS.

R 336.1912
Source: 1995 AACS.

R 336.1913
Source: 2001 AACS.

R 336.1914
Source: 2001 AACS.

R 336.1915
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R 336.1916
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R 336.1930
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R 336.1931
Source: 2002 AACS.

R 336.1932
Source: 2002 AACS.

R 336.1933
Source: 1998-2000 AACS.

R 336.1940
Source: 1998-2000 AACS.

R 336.1941
Source: 1998-2000 AACS.

R 336.1942
Source: 1998-2000 AACS.

PART 10. INTERMITTENT TESTING AND SAMPLING

R 336.2001

Source: 2002 AACS.

R 336.2002
Source: 2002 AACS.

R 336.2003
Source: 2002 AACS.

R 336.2004
Source: 2002 AACS.

R 336.2005
Source: 2002 AACS.

R 336.2006
Source: 1993 AACS.

R 336.2007
Source: 2002 AACS.

R 336.2010
Source: 1997 AACS.

R 336.2011 Reference test method 5B.
Rule 1011. Reference test method 5B, in-stack filtration method, reads as follows:
(a) The principle, applicability, and performance test criteria are as follows:
(i) Principle. Particulate matter is withdrawn isokinetically from the source and collected on solid filtering media maintained at stack temperature. The particulate matter mass is determined gravimetrically after removal of uncombined water.
(ii) Applicability. This method is applicable for the determination of particulate emissions from stationary sources as identified in table 31 of R 336.1331. The method is also applicable when specifically provided for in the department's rules, orders, a permit to install, or a permit to operate.
(iii) Performance test criteria:
(A) A performance test shall consist of a minimum of 3 separate samples of a specific air contaminant conducted within a 36-hour period, unless otherwise authorized by the department. Each of the 3 separate samples shall be obtained while the source is operating at a similar production level. For the purpose of determining compliance with an applicable emission limit, rule, or permit condition, the arithmetic mean of results of the 3 samples shall apply. If a sample is accidentally lost or conditions occur in which 1 of the 3 samples must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sampling train, extreme meteorological conditions, or other circumstances beyond the owner's or operator's control, compliance may, upon the approval of the department, be determined using the arithmetic mean of the results of 2 samples.
(B) For any source that is subject to an emission limitation calculated to 50% excess air, the multipoint, integrated sampling procedure of R 336.2004(1)(c) shall be used for gas analysis. For all other sources that require a determination of the molecular weight of the exhaust, any optional sampling procedure of R 336.2004(1)(c) may be used. Alternatives or modifications to procedures are subject to the approval of the department.
(C) The minimum volume per sample shall be 30 cubic feet of dry gas corrected to standard conditions (70 degrees Fahrenheit, 29.92 inches mercury). Minimum sample time shall be 60 minutes, which may be continuous or a combination of shorter sampling periods for sources that operate in a cyclic manner. Smaller sampling times or sample volumes, if necessitated by process variables or other factors, may be approved by the department.
(D) For any source whose emission control device alters the moisture content of the exhaust gas, a moisture determination shall be performed in a location upstream from the emission control device and in accordance with R 336.2004(1)(d) or an alternative method approved by the department.
(b) The following provisions apply to apparatus:
(i) Sampling train. A schematic of the sampling train used in this method is shown in figure 102. Construction details for many, but not all, of the train components are given in APTD-0581. (See subdivision (g)(ii) of this rule.) For changes from the APTD-0581 document and for allowable modifications to figure 102, the user shall consult with the department.
The operating and maintenance procedures for many, but not all, of the sampling train are described in APTD-0576. (See subdivision (g)(iii) of this rule.) Since correct usage is important in obtaining valid results, all users shall read APTD-0576

and adopt the applicable operating and maintenance procedures outlined in it, unless otherwise specified herein. The sampling train shall consist of the following components:

(A) Probe nozzle. Stainless steel (316) or glass with sharp, tapered leading edge. The angle of taper shall be less than 30 degrees and the taper shall be on the outside to preserve a constant internal diameter. The probe nozzle shall be of the button-hook design, unless otherwise specified by the department. If made of stainless steel, the nozzle shall be constructed from seamless tubing. Other materials of construction may be used, subject to the approval of the department.

A range of nozzle sizes suitable for isokinetic sampling shall be available, for example, 0.32 to 1.27 cm (1/8 to 1/2 in. - or larger if higher volume sampling trains are used - inside diameter (ID) nozzles in increments of 0.16 cm (1/16 in.). Each nozzle shall be calibrated according to the procedures outlined in subdivision (e) of this rule.

(B) Probe liner. Interior surface may be constructed of stainless steel (no specific grade), glass, teflon, or such other material that maintains proper flow at the stack conditions experienced.

(C) Pitot tube. Type S, as described in section 2.1 of method 2, or other device approved by the department. The pitot tube shall be attached to the probe, as shown in figure 102, to allow constant monitoring of the stack gas velocity. The impact (high pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see method 2, figure 2-6b) during sampling. The type S pitot tube assembly shall have a known coefficient, determined as outlined in section 4 of method 2.

(D) Differential pressure gauge. Incline manometer or equivalent devices (2) as described in section 2.2 of method 2. One manometer shall be used for velocity head (p) readings and the other shall be used for orifice differential pressure readings.

(E) Filter holders. Two separate filter holders in series or 1 filter holder with separate filter supports and seals for 2 filters. One filter holder with 2 filters held in contact with each other is not acceptable. Materials of construction may be stainless steel (316), glass, teflon, or other material approved by the department.

(F) Filter heating system. Auxiliary heating of the filter media is not acceptable. For saturated stack gases, the operator may opt to use filters that do not blind when wet and that do not require heating (see subdivision (c)(i)(A) of this rule).

(G) Condenser. The following system shall be used to determine the stack gas moisture content: Three impingers connected in series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. All impingers shall be of the Greenburg-Smith design and shall be modified by replacing the tip with a 1.3 cm (1/2 in.) ID glass tube extending to about 1.3 cm (1/2 in.) from the bottom of the flask. Modifications, such as using flexible connections between the impingers or using materials other than glass, are permitted, subject to the approval of the department. The first impinger shall contain a known quantity of water (subdivision (d)(i)(C) of this rule); the second shall be empty; and the third shall contain a known weight of silica gel or equivalent desiccant.

Alternatively, any system that cools the sample gas stream and allows measurement of the water condensed and moisture leaving the condenser, each to within 1 ml or 1 g, may be used, subject to the approval of the department. In any case, the means for measuring the moisture leaving the condenser shall be by passing the sample gas stream through a tared silica gel, or equivalent desiccant, trap with exit gases kept below 20 degrees Centigrade (68 degrees Fahrenheit) and determining the weight gain.

If a determination of the particulate matter collected in the impingers is required by the department's rules, a permit to install, or a permit to operate, then the impinger system described above shall be used without modification. Contact the department as to the sample recovery and analysis of the impinger contents.

(H) Metering system. Vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 3 degrees Centigrade (5.4 degrees Fahrenheit), dry-gas meter capable of measuring volume to within 2%, and related equipment as shown in figure 102. Other metering systems capable of maintaining sampling rates within 10% of isokinetic and capable of determining sample volumes to within 2% may be used, subject to the approval of the department. When the metering system is used in conjunction with a pitot tube, the system shall enable checks of isokinetic rates.

Sampling trains utilizing metering systems designed for higher flow rates than those described in APTD-0581 or APTD-0576 may be used if the specifications of this method are met.

(I) Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby national weather service station. In this case, the station value, which is the absolute barometric pressure, shall be requested and an adjustment for elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 M (100 ft.) elevation increase or vice versa for elevation decrease.

(J) Gas density determination equipment. Temperature sensor and pressure gauge, as described in sections 2.3 and 2.4 of method 2, and gas analyzer, if necessary, as described in method 3. The temperature sensor shall, preferably, be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal. Alternatively, the sensor may be attached just before use in the field. If the temperature sensor is attached in the field, then the sensor shall be placed in an interference-free arrangement with respect to the type S pitot tube openings (see method 2, figure 2-7). As a second alternative, if a difference of not more than

1% in the average velocity measurement is to be introduced, then the temperature gauge need not be attached to the probe or pitot tube. This alternative is subject to the approval of the department.
"Construction Details of Isokinetic Source Sampling Equipment," APTD-0581, April 1971 (PB203-060-LL), and "Maintenance, Calibration, and Operation of Isokinetic Source Sampling Equipment," APTD-0576, March 1972 (PB209-022-LL), are adopted by reference in this rule. Copies of these documents may be inspected at the Lansing office of the air quality division of the department of environmental quality. Copies of APTD-0581 and APTD-0576 may be obtained from the Department of Environmental Quality, Air Quality Division, P.O. Box 30260, Lansing, Michigan 48909-7760, or from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161, at a cost at the time of adoption of these rules of $28.50 each.
(ii) Sample recovery. The following items are required:
(A) Probe-liner and probe-nozzle brushes. Nylon bristle brushes with stainless steel wire handles. The probe brush shall have extensions, at least as long as the probe, made of stainless steel, nylon, teflon, or similarly inert material. The brushes shall be properly sized and shaped to brush out the probe liner and nozzle.
(B) Wash bottles -- 2. Glass wash bottles are recommended; the tester may use polyethylene wash bottles, but the acetone should not be stored in polyethylene bottles for longer than 1 month.
(C) Glass sample storage containers. Chemically resistant, borosilicate glass bottles for acetone washes, 500 ml or 1000 ml. Screw cap liners shall either be rubber-backed teflon or shall be constructed so as to be leak-free and resistant to chemical attack by acetone. Narrow-mouth glass bottles are less prone to leakage. Alternatively, polyethylene bottles may be used.
(D) Filter containers. Glass, polyethylene, or aluminum tube containers, unless otherwise specified by the department.
(E) Graduated cylinder or balance. To measure condensed water to within 1 ml or 1 g., graduated cylinders shall have subdivisions of not more than 2 ml. Most laboratory balances are capable of weighing to the nearest 0.5 g or less. Any of these balances may be used here and in paragraph (iii)(D) of this subdivision.
(F) Plastic storage containers. Airtight containers to store silica gel.
(G) Funnel and rubber policeman. To aid in the transfer of silica gel to container; not necessary if silica gel is weighed in the field.
(H) Funnel. Glass or polyethylene, to aid in sample recovery.
(iii) Analysis. The following equipment is required for analysis:
(A) Glass weighing dishes.
(B) Desiccator.
(C) Analytical balance. To measure to within 0.1 mg.
(D) Balance. To measure to within 0.5 mg.
(E) Beakers. 250 ml.
(F) Hygrometer. To measure the relative humidity of the laboratory environment.
(G) Temperature gauge. To measure the temperature of the laboratory environment.
(c) The following provisions shall apply to reagents:
(i) Sampling. The reagents used in sampling are as follows:
(A) Filters. Two in-stack filters may be any combination of alundum ceramic thimble filters, type RA-98, or glass fiber filters, type A without organic binder. The size of such filters shall allow proper sampling rates to maintain isokinetics using the nozzle sizes specified in subdivision (b)(i)(A) of this rule.
Alternatively, other types of filters may be used, subject to the approval of the department.
(B) Silica gel. Indicating type, 6 to 16 mesh. If previously used, dry at 175 degrees Centigrade (350 degrees Fahrenheit) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants that are equivalent or better may be used, subject to the approval of the department.
(C) Water. When analysis of the material caught in the impingers is required, distilled water shall be used. Run blanks before field use to eliminate a high blank of test samples.
(D) Crushed ice.
(E) Stopcock grease. Acetone-insoluble, heat-stable silicone grease. This is not necessary if screw-on connectors with teflon sleeves, or equivalent, are used. Alternatively, other types of stopcock grease may be used, subject to the approval of the department.
(ii) Sample recovery. Washing solvent. Either acetone or distilled water may be used for sample recovery. If acetone is used for washing solvent, then reagent grade, less than 0.001% residue, in glass bottles is required. Acetone from metal containers generally has a high residue blank and shall not be used.
If suppliers transfer acetone to glass bottles from metal containers, then acetone blanks shall be run before field use and only acetone with low blank values (less than 0.001%) shall be used. In no case shall a blank value of more than 0.001% of the weight of acetone used be subtracted from the sample weight.
If distilled water is used for washing solvent, use distilled water with less than 0.001% residue. Run blanks before field use

to eliminate a high blank on test samples.
(iii) Analysis. Two reagents are required for the analysis:
(A) Solvent. Same as paragraph (ii) of this subdivision for quantitative transfer.
(B) Desiccant. Anhydrous calcium sulfate, indicating type. Alternatively, other types of desiccants may be used, subject to the approval of the department.
(d) The following provisions shall apply to procedure:
(i) Sampling. The complexity of this method is such that, in order to obtain reliable results, testers shall be trained and experienced with the test procedures. Sampling shall comply with the following provisions:
(A) Pretest preparation. All the components shall be maintained and calibrated according to the applicable procedures described in APTD-0576, unless otherwise specified in this rule.
Weigh several 200 to 300 g portions of silica gel in airtight containers to the nearest 0.5 g. Record the total weight of the silica gel plus container on each container. As an alternative, the silica gel need not be preweighed, but may be weighed directly in its impinger or sampling holder just before train assembly.
Check filters visually against light for irregularities, flaws, pinhole leaks, or cracks. Label filters of the proper size on the back side using numbering machine ink. As an alternative, label the shipping containers (subdivision (b)(ii)(D) of this rule) and keep the filters in these containers at all times, except during sampling and weighing.
Dry the filters in an oven at 105 degrees Centigrade (220 degrees Fahrenheit) for a minimum of 2 hours, cool for at least 1 hour in a desiccator containing anhydrous calcium sulfate, and individually weigh and record their weights to the nearest 0.1 mg. During the weighing, the filter shall not be exposed to the laboratory atmosphere for a period of more than 2 minutes and a relative humidity above 50%. Procedures, other than those specified, that account for relative humidity effects may be used, subject to the approval of the department.
(B) Preliminary determinations. Select the sampling site and the minimum number of sampling points according to method 1 or as specified by the department. Determine the stack pressure, temperature, and the range of velocity heads using method 2; it is recommended that a leak check of the pitot lines (see method 2, section 3.1) be performed. Determine the moisture content using approximation method 4, or its alternatives, for the purpose of making isokinetic sampling rate settings. Determine the stack gas dry molecular weight, as described in method 2, section 3.6; if integrated method 3 sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as, the particulate sample run.
Select a nozzle size based on the range of velocity heads so that it is not necessary to change the nozzle size to maintain isokinetic sampling rates. During the run, do not change the nozzle size. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see section 2.2 of method 2).
Select a suitable probe liner and probe length so that all traverse points may be sampled. For large stacks, sampling from opposite sides of the stack may reduce the length of probes.
Select a total sampling time greater than or equal to the minimum total sampling time specified in the department's rules so that the sampling time per point is not less than 5 minutes, unless approved by the department, or some greater time interval as specified by the department, and so that the sample volume taken, corrected to standard conditions, exceeds the required minimum total gas sample volume. The latter is based on an approximate average sampling rate.
The number of minutes sampled at each point may be an integer or an integer plus 1/2 minute to avoid timekeeping errors.
In some circumstances, such as in batch cycles, it may be necessary to sample for shorter times at the traverse points and to obtain smaller gas sample volumes. In these cases, the department's approval shall first be obtained.
(C) Preparation of collection train. During preparation and assembly of the sampling train, keep all openings where contamination can occur covered until just before assembly or until sampling is about to begin.
Place 100 ml of water in the first impinger, leave the second impinger empty, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the third impinger. More silica gel may be used, but care shall be taken to ensure that it is not entrained and carried out from the impinger during sampling. Place the container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.
Using tweezers or clean disposable surgical gloves, place a labeled (identified) and weighed filter in each filter holder. Be sure that the filter is properly centered and the gasket properly placed so as to prevent the sample gas stream from circumventing the filter.
Install the selected nozzle using a Viton A 0-ring when stack temperatures are less than 260 degrees Centigrade (500 degrees Fahrenheit) and an asbestos string gasket when temperatures are higher. See APTD-0576 for requirements. Other connecting systems using either 310 stainless steel or teflon ferrules may be used to form a leak-free direct mechanical connection. Mark the probe with heat-resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.
Set up the train as in figure 102. If necessary, use a very light coat of silicone grease on all ground glass joints. Grease only

the outer portion (see APTD-0576) to avoid the possibility of contamination by the silicone grease.
Place crushed ice around the impingers.
(D) Leak check procedures:
(1) Pretest leak check. A pretest leak check is strongly recommended, but not required, to prevent invalid sampling and wasted time. If the tester opts to conduct the pretest leak check, the following procedure shall be used:
Perform the leak check on the entire system, including filter housings and nozzle, by plugging the nozzle and pulling a 380 mm Hg (15 in. Hg) vacuum. Alternatively, a lower vacuum may be used if it is not exceeded during the test. Leakage rates in excess of 4% of the average sampling rate or 0.00057 m^3/min (0.02 cfm), whichever is less, are unacceptable.
The following leak check instructions for the sampling train described in APTD-0576 and APTD-0581 may be helpful. Start the pump with the bypass valve fully open and the coarse adjust valve completely closed. Partially open the coarse adjust valve and slowly close the bypass valve until the desired vacuum is reached. Do not reverse the direction of the bypass valve; this will cause water to back up into the flexible sample tube and the probe. If the desired vacuum is exceeded, either leak-check at this higher vacuum or end the leak check and start over.
When the leak check is completed, first slowly remove the plug from the inlet to the nozzle and immediately turn off the vacuum pump. This prevents the water in the first impinger from being forced backward into the sample tube and prevents silica gel from being entrained backward into the second impinger.
(2) Leak checks during sample run. If, during the sampling run, a component (such as a filter assembly or impinger) change becomes necessary, a leak check shall be conducted immediately before the change is made. The leak check shall be done according to the procedure outlined in paragraph (i)(D)(1) of this subdivision, except that it shall be done at a vacuum equal to or greater than the maximum value recorded up to that point in the test. If the leakage rate is not more than 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate, whichever is less, then the results are acceptable and no correction need be applied to the total volume of dry gas metered. If a higher leakage rate is obtained, then the tester shall either record the leakage rate and plan to correct the sample volume, as shown in subdivision (f)(iii) of this rule, or shall void the sampling run.
Immediately after component changes, leak checks may be performed. If leak checks are done, then the procedure outlined in paragraph (i)(D)(1) of this subdivision shall be used.
(3) Post-test leak check. A leak check is required at the conclusion of each sampling run. The leak check shall be performed in accordance with the procedures in paragraph (i)(D)(1) of this subdivision, except that it shall be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is not more than 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate, whichever is less, then the results are acceptable and no correction need be applied to the total volume of dry gas metered. If a higher leakage rate is obtained, then the tester shall either record the leakage rate and correct the sample volume, as shown in subdivision (f)(iii) of this rule, or shall void the sampling run.
(E) Particulate train operation. During the sampling run, maintain an isokinetic sampling rate that is within 10% of true isokinetic, unless otherwise specified by the department.
For each run, record the data required on a data sheet such as the data sheet in figure 104. Record the initial dry-gas meter reading. Record the dry-gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made, before and after each leak check, and when sampling is halted. Take other readings required by figure 104 at least once at each sample point during each time increment, and take additional readings when significant changes (20% variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.
Clean the portholes before the test run to minimize the chance of sampling deposited material. To begin sampling, remove the nozzle cap and verify that the pitot tube and probe are properly positioned. Position the nozzle at the first traverse point with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions. Nomographs that aid in the rapid adjustment of the isokinetic sampling rate without excessive computations are available. These nomographs are designed for use when the type S pitot tube coefficient is 0.85 ±0.02 and the stack gas equivalent density (dry molecular weight) is equal to 29 ±4. APTD-0576 details the procedure for using the nomographs. If C_p and M_d are outside the above stated ranges, do not use the nomographs unless appropriate steps (subdivision (g)(iv) of this rule) are taken to compensate for the deviations.
When the stack is under significant negative pressure (height of impinger stem), take care to pull low flow when inserting the probe into the stack to prevent water from backing into the sample tubing and to avoid pulsation through the filter and possible loss of materials.
When the probe is in position, block off the openings around the probe and porthole to prevent unrepresentative dilution of the gas stream.
Traverse the stack cross section, as required by method 1 or as specified by the department, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the portholes; this minimizes the chance of extracting deposited material.

During the test run, add more ice and, if necessary, salt to maintain a temperature of less than 20 degrees Centigrade (68 degrees Fahrenheit) at the condenser/silica gel outlet. Also, periodically check the level and zero of the manometer.

If the pressure drop across the filter becomes too high and makes isokinetic sampling difficult to maintain, the filter may be replaced in the midst of a sample run. It is recommended that another complete filter assembly be used rather than attempting to change the filter itself. Before a new filter assembly is installed, conduct a leak check (paragraph (i)(D)(2) of this subdivision). The total particulate weight shall include the summation of all filter assembly catches.

A single train shall be used for the entire sample run, except in cases where simultaneous sampling is required in 2 or more separate ducts, at 2 or more different locations within the same duct, or where equipment failure necessitates a change of trains. In all other situations, the use of 2 or more trains shall be subject to the approval of the department.

When 2 or more trains are used, separate analyses of the front-half and, if applicable, impinger catches from each train shall be performed, unless identical nozzle sizes were used on all trains. If identical nozzle sizes were used, the front-half catches from the individual trains may be combined, as may the impinger catches, and 1 analysis of front-half catch and 1 analysis of impinger catch may be performed. Consult with the department for details concerning the calculation of results when 2 or more trains are used.

At the end of the sample run, turn off the coarse adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final dry-gas meter reading, and conduct a post-test leak check, as outlined in paragraph (i)(D)(3) of this subdivision. Leak-check the pitot lines as described in method 2, section 3.1; the lines shall pass this leak check to validate the velocity head data.

(F) Calculation of percent isokinetic. Calculate percent isokinetic (see subdivision (f) of this rule) to determine if the run was valid or if another test run should be made. If there was difficulty in maintaining isokinetic rates due to source conditions, consult with the department for possible variance on the isokinetic rates.

(ii) Sample recovery. Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool.

When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over it to prevent losing or gaining particulate matter. Do not cap off the probe tip tightly while the sampling train is cooling down as this creates a vacuum in the filter holder and draws water from the impingers into the sample tube.

Before moving the sampling train to the cleanup site, make sure all condensed water in the probe and flexible sample lines are drained into the first impinger. Disconnect all sample lines and remove the nozzle-filter set assembly from the probe. Cap all openings to prevent contamination or accidental loss of sample. Remove all excess particulate from the exterior of the nozzle-filter assembly to prevent contamination during disassembly.

Transfer the nozzle-filter set assembly and impinger set to the cleanup area. The cleanup area shall be clean and protected from the wind so that the chances of contaminating or losing the sample are minimized.

Save a portion of the solvent used for cleanup as a blank. Take 200 ml of this solvent directly from the wash bottle being used and place it in a glass sample container labeled "solvent blank".

Inspect the train before and during disassembly and note any abnormal conditions. Treat the samples in the following manner:

Container Nos. 1, 1A. Carefully remove the filters from the filter holders and place in their identified containers. Use a pair of tweezers or clean disposable surgical gloves, or both, to handle the filters. Carefully transfer to the container any particulate matter or filter fibers, or both, that adhere to the filter holder gasket by using a dry nylon bristle brush or sharp-edged blade, or both. Seal the containers.

Container No. 2. Taking care to see that particulate on the outside of the nozzle and filter holders does not get into the sample, the testor shall carefully remove the nozzle and clean the inside surface by rinsing with solvent from a wash bottle and brushing with a nylon bristle brush. Brush until the solvent rinse shows no visible particles and then make a final rinse of the inside surface with solvent.

After ensuring that all joints have been cleaned of all extraneous material, the testor shall quantitatively remove particulate from the filter holders by rubbing the surfaces with a nylon bristle brush and rinsing with solvent. Rinse each surface 3 times, or more if needed, to remove visible particulate. Make a final rinse of the brush and filter holder set. After all solvent washings and particulate matter have been collected in the sample container, tighten the lid on the sample container so that solvent will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine if leakage occurred during transport. Label the container to clearly identify its contents.

Container No. 3. Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the third impinger to its original container and seal. A funnel may make it easier to pour the silica gel without spilling it. A rubber policeman may be used as an aid in removing the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that adhere to the impinger wall and are difficult to remove. Since the gain in weight will be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, follow the procedure for container No. 3 in paragraph (iii) of this subdivision.

Impinger water. Treat the impingers in the following manner: Make a notation of any color or film in the liquid catch. Measure the liquid that is in the first 2 impingers to within ±1 ml by using a graduated cylinder or by weighing it to within ±1.0 g by using a balance if one is available. Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas.
Discard the liquid after measuring and recording the volume or weight, unless analysis of the impinger catch is required (subdivision (b)(i)(G) of this rule).
If a different type of condenser is used, measure the amount of moisture condensed either volumetrically or gravimetrically.
If possible, containers shall be shipped in a manner that keeps them upright at all times.
(iii) Analysis. Record the data required on a sheet such as the sheet in figure 106. Handle each sample container in the following manner:
Container Nos. 1, 1A. Analyze and report each filter separately. Transfer the filter and any loose particulate from the sample container to a tared-glass weighing dish. Dry the filter in an oven at 105 degrees Centigrade (220 degrees Fahrenheit) for a minimum of 2 hours, cool for at least 1 hour in a desiccator containing anhydrous calcium sulfate and weigh and record its weight to the nearest 0.1 mg. During the weighing the filter shall not be exposed to the laboratory atmosphere for a period greater than 2 minutes or a relative humidity above 50%. Procedures, other than those specified, that account for relative humidity effects may be used, subject to the approval of the department. The method used for drying and weighing of filters shall be consistent before and after the test.
Container No. 2. Note the level of liquid in the container and confirm on the analysis sheet if leakage occurred during transport. If a noticeable amount of leakage has occurred, then either void the sample or use methods, subject to the approval of the department, to correct the final results. Measure the liquid in this container either volumetrically to ±1 ml or gravimetrically to ±1.0 g. Transfer the contents to a tared 250 ml beaker and evaporate to dryness either at ambient temperature and pressure for acetone or at 95 degrees Centigrade (203 degrees Fahrenheit) in an oven for distilled water. Then subject the sample to 250 degrees Centigrade (482 degrees Fahrenheit) in an oven for 2 to 3 hours. Desiccate 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.
Container No. 3. Weigh the spent silica gel, or silica gel plus impinger, to the nearest 0.5 g using a balance. This step may be conducted in the field.
"Solvent blank" container. Measure solvent in this container either volumetrically or gravimetrically. Transfer the contents to a tared 250 ml beaker and evaporate to dryness either at ambient temperature and pressure for acetone or at 95 degrees Centigrade (203 degrees Fahrenheit) in an oven for distilled water. Then subject the sample to 250 degrees Centigrade (482 degrees Fahrenheit) in an oven for 2 to 3 hours. Desiccate for 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.
If acetone is used, the contents of Container No. 2, as well as the acetone blank container, may be evaporated at temperatures higher than ambient. If evaporation is done at an elevated temperature, then the temperature shall be closely supervised, and the contents of the beaker shall be swirled occasionally to maintain an even temperature. Use extreme care, as acetone is highly flammable and has a low flash point.
(e) Calibration. Maintain a laboratory log of all calibrations. Calibrations shall comply with the following provisions:
(i) Probe nozzle. Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in.). Make 3 separate measurements using different diameters each time and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in.). When nozzles become nicked, dented, or corroded, they shall be reshaped, sharpened, and recalibrated before use. Each nozzle shall be permanently and uniquely identified.
(ii) Pitot tube. The type S pitot tube assembly shall be calibrated according to the procedures in section 4 of method 2.
(iii) Metering system. Before its initial use in the field, the metering system shall be calibrated according to the procedure in APTD-0576. Instead of physically adjusting the dry-gas meter dial readings to correspond to the wet-test meter readings, calibration factors may be used to mathematically correct the gas meter dial readings to the proper values. Before calibrating the metering system, a leak check may be conducted. For metering systems having diaphragm or rotary pumps, the normal leak check procedure will not detect leakages within the pump. For these cases, the following leak check procedure may be used: Make a 10-minute calibration run at 0.00057 m^3/min (0.02 cfm); at the end of the run, take the difference of the measured wet-test meter and dry-gas meter volumes; divide the difference by 10 to get the leak rate. The leak rate shall not exceed 0.00057 m^3/min (0.02 cfm).
After each field use, the calibration of the metering system shall be checked by performing 3 calibration runs at a single, intermediate orifice setting, based on the previous field test, with the vacuum set at the maximum value reached during the test series. To adjust the vacuum, insert a valve between the wet-test meter and the inlet of the metering system. Calculate the average value of the calibration factor. If the calibration has changed by more than 5%, then recalibrate the meter over the full range of orifice settings, as outlined in APTD-0576.
Alternatively, a spirometer may be substituted for a wet-test meter in the above calibration procedures.

Alternative procedures, such as using the orifice meter coefficients, may be used, subject to the approval of the department. If the dry-gas meter coefficient values obtained before and after a test series differ by more than 5%, then the test series shall be performed using whichever meter coefficient value (before or after) gives the lower value of total sample volume.
(iv) Temperature gauges. Use the procedure in section 4.3 of method 2 to calibrate in-stack temperature gauges. Dial thermometers, such as those used for the dry-gas meter and condenser outlet, shall be calibrated against mercury-in-glass thermometers.
(v) Leak check of metering system shown in figure 102. That portion of the sampling train from the pump to the orifice meter shall be leak-checked before initial use and after each shipment. Leakage after the pump will result in less volume being recorded than is actually sampled. The following procedure is suggested (see figure 107): Close the main valve on the meter box. Insert a 1-hole rubber stopper with rubber tubing attached into the orifice exhaust pipe. Disconnect and vent the low side of the orifice manometer. Close off the low side orifice tap. Pressurize the system to 13 to 18 cm (5 to 7 in.) water column by blowing into the rubber tubing. Pinch off the tubing and observe the manometer for 1 minute. A loss of pressure on the manometer indicates a leak in the meter box; leaks, if present, shall be corrected.
(vi) Barometer. Calibrate against a mercury barometer.
(f) Calculations. When carrying out calculations, retain at least 1 extra decimal figure beyond that of the acquired data. Round off figures after the final calculation. Other forms of the equations may be used if they give equivalent results. The following provisions apply to calculations:
(i) Nomenclature:

A_n = Cross-sectional area of nozzle, m^2($ft.^2$).

A = Cross-sectional area of stack or flue at the point of sampling, ft^2.

B_{ws} = Water vapor in the gas stream, proportion by volume, expressed as a fraction.

B_{wi} = Percent water vapor in gas entering source particulate control device determined by method 4.

B_{wo} = Percent water vapor in gas exiting source particulate control device.

C_a = Wash blank residue concentration, mg/g.

C_s = Concentration of particulate matter in stack gas, pounds **per 1,000 pounds** of actual stack gas.

C_{sD} = Concentration of particulate matter in stack gas, moisture excluded, pounds per 1000 pounds of dry stack gas.

C_{s50} = Concentration of particulate matter corrected to 50% excess air, pounds per 1000 pounds of stack gas.

C_{s50D} = Concentration of particulate matter corrected to 50% excess air, excluding any water addition from a collector, pounds per 1000 pounds of stack gas.

E = Mass emission rate of particulate, lb/hr.

F_{50} = Concentration conversion factor to 50% excess air with no moisture alterations in exhaust.

F_{50D} = Concentration conversion factor to 50% excess air, excluding any moisture added to exhaust gas by pollution collection system.

F_D = Concentration conversion factor to dry basis, excluding any water in the stack gas.

I = Percent of isokinetic sampling.

L_a = Maximum acceptable leakage rate for either a pretest leak check or for a leak check following a component change; equal to 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak check conducted before the "ith" component change (i = 1, 2, 3 . . . . n), m^3/min (cfm).

L_p = Leakage rate observed during the post-test leak check, m^3/min (cfm).

M_d = Molecular weight of dry stack gas, g/g mole (lb/lb-mole), calculated by method 3, equation 3-2, using data from integrated method 3.

m_n = Total amount of particulate matter collected, mg.

M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

m_a = Mass of residue of solvent after evaporation, mg.

m_g = Total weight of gas samples through nozzle, lb.

P_{bar} = Barometric pressure at the sampling site, mm Hg (in. Hg).

P_s = Absolute stack gas pressure.

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 mm Hg-m^3/°K-g-mole (21.85 in. Hg-$ft.^3$/°R-lb-mole).

T_m = Absolute average dry-gas meter temperature (see figure 104), °K (°R).

T_s = Absolute average stack gas temperature (see figure 104), °K (°R).

T_{std} = Standard absolute temperature, 294.I°K (530°R).

V_a = Volume of solvent blank, ml.

V_{aw} = Volume of solvent used in wash, ml.

V_{lc} = Total volume of liquid collected in impingers and silica gel (see figure 106), ml.

V_m = Volume of gas sample as measured by the dry-gas meter, dcm (dcf).

$V_{m(std)}$ = Volume of gas sample measured by the dry-gas meter, corrected to standard conditions, dscm (dscf).

$V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

V_s = Stack gas velocity, calculated by method 2, equation 2-9, using data obtained from method 5, m/sec (ft./sec).

W_a = Weight of residue in solvent wash, mg.

Y = Dry-gas meter calibration factor.

ΔH = Average pressure differential across the orifice meter (see figure 104), mm H_20 (in. H_20).

$\%0_2$ = Percent oxygen in stack gas by volume (dry basis).

$\%N_2$ = Percent nitrogen in stack gas by volume (dry basis).

p_a = Density of solvent, mg/ml.

$p_{s(std)}$ = Density of all sampled gas at standard conditions, $lb/ft.^3$

p_w = Density of water, 0.9982 g/ml (0.002201 lb/ml).

θ = Total sample time, min.

θ_1 = Sample time, interval, from the beginning of a run until the first component change, min.

θ_i = Sampling time interval, between 2 successive component changes, beginning with the interval between the first and second changes, min.

θ_p = Sampling time interval, from the final (n^{th}) component change until the end of the sampling run, min.

13.6 = Specific gravity of mercury.

60 = Sec/min.

100 = Conversion to percent.

386.9 = Cubic feet per lb-mole of ideal gas at standard conditions.

453.6 = Conversion of pounds to grams.

3600 = Conversion of hours to sec.

1000 = Conversion of 1000 lb units to lb units.

(ii) Average the dry-gas meter temperature and average the orifice pressure drop. See data sheet (figure 5-2).
(iii) Dry gas volume. Correct the sample volume measured by the dry-gas meter to standard conditions (21.11 degrees Centigrade, 760 mm Hg or 70 degrees Fahrenheit, 29.92 in. Hg) by using equation 5-1.
equation 5-1

$$V_{m(std)} = \frac{V_m\ Y\ T_{std}\ (P_{bar} + \Delta H / 13.6)}{T_m\ P_{std}} = K_1\ V_m\ Y\ \frac{(P_{bar} + \Delta H / 13.6)}{T_m}$$

Where:
K_1 = 0.3869 °K/mm Hg for metric units.
= 17.71 °R/in. Hg for English units.

Equation 5-1 may be used as written. However, if the leakage rate observed during any of the mandatory leak checks (for example, the post-test leak check or leak checks conducted before component changes) exceeds L_a, equation 5-1 shall be modified in the following manner:
(A) Case I. No component changes made during sampling run. In this case, replace V_m in equation 5-1 with the following expression:

$$V_m - (L_p - L_a)\,\theta$$

(B) Case II. One or more component changes made during the sampling run. In this case, replace V_m in equation 5-1 by the following expression:

$$V_m - (L_1 - L_a)\theta_1 - \sum_{i=2}^{n} (L_i - L_a)\theta_i - (L_p - L_a)\theta_p$$

and substitute only for those leakage rates (L_i or L_p) that exceed L_a.
(iv) Volume of water vapor.
equation 5-2

$$V_{w(std)} = V_{1c}\ (p_w / M_w)\ (R\ T_{std} / P_{std}) = K_2\ V_{1c}$$

Where:
K_2 = 0.001338 m³/ml for metric units.

(v) Moisture content.
equation 5-3

$$B_{ws} = V_{w(std)} / (V_{m(std)} + v_{w(std)})$$

In saturated or water droplet--laden gas streams, 2 calculations of the moisture content of the stack gas shall be made: 1 from the impinger analysis (equation 5-3), and a second from the assumption of saturated conditions. The lower of the 2 values of B_{ws} shall be considered correct. The procedure for determining the moisture content based upon assumption of saturated conditions is given in the note of section 1.2 of method 4. For the purpose of this method, the average stack gas temperature from figure 104 may be used to make the determination, if the accuracy of the instack temperature sensor is ±1 degree Centigrade (2 degrees Fahrenheit).
(vi) Solvent blank concentration.
equation 5-4

$$C_a = m_a / (V_a \;\; P_a)$$

(vii) Solvent wash blank.
equation 5-5

$$W_a = C_a \; V_{aw} \; P_a$$

(viii) Total particulate weight. Determine the total particulate catch from the sum of the weights obtained from containers 1, 1A, and 2 less the wash solvent blank (see figure 106).
Refer to subdivision (d)(i)(E) of this rule to assist in the calculation of results involving 2 or more pairs of filters or 2 or more sampling trains.
(ix) Sampled gas density. Determine the density of the gas sampled from the stack, at standard conditions (lb/ft.[3]).
equation 5-6

$$P_{s(std)} = (M_d \; (1 - B_{ws}) + M_w \; B_{ws}) / 386.9$$

(x) Total weight of gas sampled (lbs).
equation 5-7

$$m_g = (V_{m(std)} + V_{w(std)}) \; p_{s(std)}$$

(xi) Particulate concentration (lbs/1000 lbs).
equation 5-8

$$C_s = m_n / (453.6 \; m_g)$$

(xii) Excess air and moisture correction factors:
(A) Correction factor to 50% excess air for those sources with or without any particulate collector where no increase in moisture content of the exhaust gas occurs after the process and before the point of sampling.
equation 5-9

$$F_{50} = \frac{M_d + 18 \; B_{wo} / (100 - B_{wo})}{0.1826 \, \% N_2 - 2.0592 \, \% 0_2 + M_d + 18 \; B_{wo} / (100 - B_{wo})}$$

(B) Correction factor to 50% excess air for those sources with a wet collection device (scrubber) that increases the moisture content of the exhaust gas after the process and before the point of sampling.
equation 5-10

$$F_{50D} = \frac{M_d + 18 \; B_{wo} / (100 - B_{wo})}{0.1826 \, \% N_2 - 2.0592 \, \% 0_2 + M_d + 18 \; B_{wi} / (100 - B_{wi})}$$

(C) Correction factor to convert the actual concentration, C_s, to dry conditions.
equation 5-11

$$F_D = \frac{M_d + 18 \; B_{wo} / (100 - B_{wo})}{M_d}$$

(xiii) Converted particulate concentrations, where applicable under the department's rules or permit.
equation 5-12

$$C_{s50} = C_s \; F_{50}$$

equation 5-13

$$C_{s50D} = C_s \; F_{50D}$$

equation 5-14

$$C_{sD} = C_s \; F_D$$

(xiv) Mass emission rate (lb/hr).
equation 5-15

$$E = \frac{3600\, A\; V_s\;\; C_s\;\; P_s\;\; T_{std}\;\; P_{s(std)}}{1000\;\; T_s\;\; P_{std}} = K_3\; A\; V_s\;\; C_s\;\; P_s\;\; P_{s(std)} / T_s$$

Where:
K_3 = 63.77 for English units.

(xv) Isokinetic variation:
(A) Calculation from raw data.
equation 5-16

$$I = \frac{100\;\; T_s\; (K_4\;\; V_{lc}\; + \;(V_m / T_m)(P_{bar}\; + \;\Delta H / 13.6))}{60\; \theta\, V_s\;\; P_s\;\; A_n}$$

Where:
K_4 = 0.003458 mm Hg - m³ml - °K for metric units.
= 0.002672 in. Hg - ft.³/ml - °R for English units.

(B) Calculation from intermediate values.
equation 5-17

$$I = \frac{T_s\;\; V_{m(std)}\;\; P_{std}\;\; 100}{T_{std}\;\; V_s\;\; \theta\;\; A_n\;\; P_s\;\; 60(1 - B_{ws})} = K_5\; \frac{T_s\;\; V_{m(std)}}{P_s\;\; V_s\;\; A_n\;\; \theta\, (1 - B_{ws})}$$

Where:
K_5 = 4.307 for metric units.
= 0.09409 for English units.

(xvi) Acceptable results. If 90%≤I≤110%, then the results are acceptable. If the results are low in comparison to the standard and I is beyond the acceptable range, or if I is less than 90%, then the department may opt to accept the results. Otherwise, reject the results and repeat the test.
(g) Bibliography:
(i) Federal Register, Volume 42, No. 160, Part 160, Chapter 1, Title 40, Appendix A, Method 5, August 18, 1977.
(ii) Martin, Robert M. Construction Details of Isokinetic Source Sampling Equipment. Environmental Protection Agency. Research Triangle Park, N.C. APTD-0581. April, 1971.
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(iv) Shigehara, R. T. "Adjustments in the EPA Nomograph for Different Pitot Tube Coefficients and Dry Molecular Weights." Stack Sampling News, 2:4 - 11. October, 1974.
(v) Guidelines for Source Testing of Particulate. Michigan Department of Natural Resources, Air Quality Division. June 1, 1977.
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Source: 2002 AACS.

R 336.2013
Source: 2002 AACS.

R 336.2014
Source: 2002 AACS.

R 336.2021
Source: 2002 AACS.

R 336.2030
Source: 1985 AACS.

R 336.2031
Source: 1985 AACS.

R 336.2032
Source: 1985 AACS.

R 336.2033
Source: 1985 AACS.

R 336.2040
Source: 2002 AACS.

R 336.2041
Source: 2002 AACS.

PART 11. CONTINUOUS EMISSION MONITORING

R 336.2101
Source: 2002 AACS.

R 336.2102
Source: 1980 AACS.

R 336.2103
Source: 1980 AACS.

R 336.2150
Source: 2002 AACS.

R 336.2151
Source: 1989 AACS.

R 336.2152
Source: 1980 AACS.

R 336.2153
Source: 1989 AACS.

R 336.2154
Source: 1980 AACS.

R 336.2155
Source: 2002 AACS.

R 336.2159
Source: 2002 AACS.

R 336.2170
Source: 2002 AACS.

R 336.2175
Source: 2002 AACS.

R 336.2176
Source: 1989 AACS.

R 336.2189
Source: 2002 AACS.

R 336.2190
Source: 2002 AACS.

R 336.2199
Source: 1997 AACS.

PART 12. EMISSION AVERAGING AND EMISSION REDUCTION CREDIT TRADING

R 336.2201

Source: 1998-2000 AACS.

R 336.2202

Source: 1998-2000 AACS.

R 336.2203

Source: 1998-2000 AACS.

R 336.2204
Source: 1998-2000 AACS.

R 336.2205

Source: 1998-2000 AACS.

R 336.2206

Source: 1998-2000 AACS.

R 336.2207
Source: 1998-2000 AACS.

R 336.2208

Source: 1998-2000 AACS.

R 336.2209

Source: 1998-2000 AACS.

R 336.2210
Source: 1996 AACS.

R 336.2211
Source: 1998-2000 AACS.

R 336.2212
Source: 1998-2000 AACS.

R 336.2213
Source: 1998-2000 AACS.

R 336.2214
Source: 1998-2000 AACS.

R 336.2215
Source: 1998-2000 AACS.

R 336.2216
Source: 1998-2000 AACS.

R 336.2217
Source: 1998-2000 AACS.

R 336.2218
Source: 1998-2000 AACS.

PART 13. AIR POLLUTION EPISODES

R 336.2301
Source: 1997 AACS.

R 336.2302
Source: 1997 AACS.

R 336.2303
Source: 1997 AACS.

R 336.2304
Source: 1997 AACS.

R 336.2305
Source: 1997 AACS.

R 336.2306
Source: 1997 AACS.

R 336.2307
Source: 1997 AACS.

R 336.2308
Source: 1997 AACS.

PART 14. CLEAN CORPORATE CITIZEN PROGRAM

R 336.2401
Source: 1998-2000 AACS.

R 336.2402
Source: 1998-2000 AACS.

R 336.2403
Source: 1998-2000 AACS.

R 336.2404
Source: 1998-2000 AACS.

R 336.2405
Source: 1998-2000 AACS.

R 336.2406
Source: 1998-2000 AACS.

R 336.2407
Source: 1998-2000 AACS.

R 336.2408
Source: 1998-2000 AACS.

R 336.2409
Source: 1998-2000 AACS.

R 336.2412
Source: 1998-2000 AACS.

R 336.2413
Source: 1997 AACS.

R 336.2414
Source: 1997 AACS.

R 336.2415
Source: 1997 AACS.

R 336.2420
Source: 1998-2000 AACS.

PART 16. ORGANIZATION, OPERATION, AND PROCEDURES

R 336.2601
Source: 1997 AACS.

R 336.2602
Source: 1997 AACS.

R 336.2603
Source: 1997 AACS.

R 336.2604
Source: 1997 AACS.

R 336.2605
Source: 1997 AACS.

R 336.2606
Source: 1980 AACS.